DOCUMENT RESUME

ED 091 564 CE 001 335

TITLE	Flight Test Guide (Part 61 Revised): Instrument Pilot: Helicopter.
INSTITUTION	Federal Aviation Administration (DOT), Washington, D.C. Flight Standards Service.
PUB DATE	73
NOTE	30p.
AVAILABLE FROM	Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 (Stock Number 5007-00215, $0.40)
EDRS PRICE	MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS	*Aircraft Pilots; *Certification; Guides; Performance Criteria; *Performance Specifications; Skills; *Testing

ABSTRACT

The guide provides an outline of the skills required to pass the flight test for an Instrument Pilot Helicopter Rating under Part 61 (Revised) of Federal Aviation Regulations. General procedures for flight tests are described and the following pilot operations outlined: maneuvering by reference to instruments, IFR navigation, instrument approaches, cross-country flying, and emergency operations. Under each heading the objective, procedures, and maneuvers are outlined, followed by descriptions and acceptable performance guidelines for each item. The guide is intended to aid both applicant and instructor and assist FAA inspectors and designated pilot examiners in the conduct and standardization of flight tests. (DS)

ED 091564

AC 61-64

FLIGHT TEST GUIDE

[Part 61-Revised]

INSTRUMENT PILOT

Helicopter

AC 61-33C

1973

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

ED 091564

FLIGHT TEST GUIDE

[Part 61 Revised]

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FLIGHT STANDARDS SERVICE

For sale by the Superintendent of Documents
U.S. Government Printing Office, Washington, D.C., 20402
Price 40 cents
Stock Number 5007-00215

PREFACE

Part 61 (revised) of Federal Aviation Regulations, effective November 1, 1973, establishes a new concept of pilot training and certification requirements. To provide a transition to these revised requirements, Part 61 (revised) permits the applicant, for a period of 1 year after the effective date, to meet either the previous requirements or those contained in the revised part.

This flight test guide, AC 61-64, has been prepared by Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the flight test for the Instrument Pilot Helicopter Rating under Part 61 (revised). It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for the Instrument Rating. A suggested flight test checklist is included for the convenience of those who may find such a checklist useful.

In addition to providing help to the applicant and his instructor, this guide will be useful to FAA Inspectors and designated pilot examiners in the conduct and standardization of flight tests. Persons using this guide in connection with instrument pilot training and flight tests should also refer to the applicable

Federal Aviation Regulations; Airman's Information Manual; Instrument Flying Handbook, AC 61–27B; Civil Use of U.S. Government Instrument Approach Procedure Charts, AC 90–1A; and other pertinent advisory circulars.

Comments regarding this guide may be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

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APPLICANT'S FLIGHT TEST GUIDE CHECKLIST

(Suggested)

APPOINTMENT WITH INSPECTOR OR EXAMINER: Name _____

Time/Date _____

PROPERLY CERTIFICATED HELICOPTER WITH DUAL CONTROLS

- ☐ View-Limiting Device
- ☐ Aircraft Documents:
  - Airworthiness Certificate
  - Registration Certificate
  - Operating Limitations
  - Owner's Handbook/Manual
- ☐ Aircraft Maintenance Records:
  - Airworthiness Inspections
  - Static System and Altimeter Check
- ☐ FCC Station License

PERSONAL EQUIPMENT

- ☐ Current Charts
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs

PERSONAL RECORDS

- ☐ Pilot Certificate
- ☐ Medical Certificate
- ☐ Signed Recommendation
- ☐ Written Test Results
- ☐ Logbook
- ☐ Notice of Disapproval (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ FCC Radiotelephone Operator Permit
- ☐ Examiner's Fee (if applicable)

GENERAL INFORMATION

PILOT TRAINING AND CERTIFICATION CONCEPT

Part 61 of the Federal Aviation Regulations has been revised and upgraded to reflect the complexity of the modern aircraft as well as its operating environment. In the past, airman certification requirements could be met by training a student to pass a written test and then to demonstrate his ability to perform predetermined flight training maneuvers during a flight test. Rather than merely duplicating on the flight test the maneuvers used for training, the new training and certification concept requires that the applicant receive instruction in and demonstrate his competency in *all pilot operations* listed in pertinent sections of the Part 61 (revised). A pilot operation, as used herein, is a group of related procedures and maneuvers involving skills and knowledge required to safely and efficiently function as a pilot. The specific procedures and maneuvers used to teach the pilot operations are not listed in Part 61 (revised). Instead, the instructor is permitted to select procedures and maneuvers from FAA-approved training publications pertinent to the certificate or rating sought. The instructor indicates by logbook endorsement

that the applicant has demonstrated competency in all the required pilot operations and considers him qualified to pass the flight test. On the flight test, the examiner[1] selects the procedures and maneuvers to be performed by the applicant to show competency in each required pilot operation.

The procedures and maneuvers appropriate to the Instrument Pilot Helicopter rating are contained in *Instrument Flying Handbook, AC 61-27B; Airman's Information Manual;* and *Civil Use of U.S. Government Approach Procedure Charts, AC 90-1A.*

USE OF THIS GUIDE

The pilot operations in this flight test guide, indicated by Roman numerals, are required by § 61.95 of Part 61 (revised). This guide is intended only to outline appropriate pilot operations and the minimum standards for the performance of each procedure or maneuver which will be accepted by the examiner as evidence of the pilot's competency. It is not intended that the applicant be tested on every procedure or maneuver within each pilot operation, but only those considered necessary by the examiner to determine competency in each pilot operation. Throughout the flight test, certain procedures

[1] The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or designated pilot examiner who conducts an official flight test.

or maneuvers may be evaluated separately or in combination with other procedures or maneuvers.

When, in the judgment of the examiner, certain demonstrations are impractical, competency may be determined by oral testing.

This guide contains an **Objective** for each required pilot operation. Under each pilot operation, pertinent procedures or maneuvers are listed with **Descriptions** and **Acceptable Performance Guidelines**.

1. The **Objective** states briefly the purpose of each pilot operation required on the flight test.

2. The **Description** provides information on what may be asked of the applicant regarding the selected procedure or maneuver. The procedures or maneuvers listed have been found most effective in demonstrating the objective of that particular pilot operation.

3. The **Acceptable Performance Guidelines** include the factors which will be taken into account by the examiner in deciding whether the applicant has met the objective of the pilot operation. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. However, consistently exceeding these tolerances before corrective action is initiated or prematurely descending below DH or MDA, is indicative of an

unsatisfactory performance. Any procedure or action, or the lack thereof, which requires the intervention of the examiner to maintain safe flight will be disqualifying.

In the event the applicant takes the instrument pilot flight test and the commercial pilot flight test simultaneously, the maneuvers selected by the examiner for each may be combined and evaluated together, where practicable.

GENERAL PROCEDURES FOR FLIGHT TESTS

The ability of an applicant for an instrument pilot helicopter rating to perform the required pilot operations is based on the following:

1. Completing a checklist for instrument flight operations appropriate to the helicopter and equipment used.
2. Performing procedures and maneuvers within the helicopter's performance capabilities and limitations, including use of the helicopter's systems.
3. Performing emergency procedures and maneuvers appropriate to the helicopter.
4. Piloting the helicopter with smoothness and accuracy.
5. Exercising judgment.
6. Applying his aeronautical knowledge.

7. Showing that he is the master of the helicopter, with the successful outcome of a procedure or maneuver never seriously in doubt.

If the applicant fails any of the required pilot operations, he fails the flight test. The examiner or the applicant may discontinue the test at any time when the failure of a required pilot operation makes the applicant ineligible for the certificate or rating sought. If the test is discontinued, the applicant is entitled to credit for only those entire pilot operations that he has successfully performed.

Prior to flight, it should be clearly understood by the applicant and the examiner what copilot duties, if any, the examiner will perform during the flight test.

FLIGHT TEST PREREQUISITES

An applicant for the instrument pilot helicopter flight test is required by revised § 61.39 of the Federal Aviation Regulations to have: (1) passed the Instrument Pilot Helicopter Written Test within 24 months before the date he takes the flight test; (2) the applicable instruction and aeronautical experience prescribed in Part 61 (revised); (3) at least a third class medical certificate issued within the past 24 months; and (4) a written statement from a certificated helicopter instrument flight instructor certifying that he has given the applicant flight instruction in preparation for the flight test

within 60 days preceding the date of application, and finds him competent to pass the flight test and to have a satisfactory knowledge of the subject areas in which he is shown to be deficient by his airman written test report.

HELICOPTER AND EQUIPMENT REQUIREMENTS FOR FLIGHT TEST

The applicant is required by revised § 61.45 to provide an airworthy helicopter for the flight test. This helicopter must have fully functioning dual controls, must be capable of and its operating limitations must not prohibit, the pilot operations required on the flight test. Flight instruments required are those appropriate for controlling the helicopter in instrument conditions. Appropriate flight instruments are considered to be those outlined in FAR Part 91 for flight under instrument flight rules. The required radio equipment is that necessary for communications with ATC and for the performance of VOR, ADF, and ILS (glide slope, localizer and marker beacon) approaches.

PILOT OPERATIONS

Procedures/Maneuvers

I. MANEUVERING BY REFERENCE TO INSTRUMENTS

Objective

To determine that the applicant can safely and accurately maneuver the helicopter in instrument conditions.

Procedures/Maneuvers

A. Straight-and-Level Flight

1. Description The applicant may be asked to demonstrate straight-and-level flight with changes in airspeed and, if possible, helicopter configuration. He will be expected to maintain altitude and heading and to accurately control airspeed.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his ability to maintain altitude within ± 100 ft., heading within $\pm 10°$, and airspeed within ± 10 kts. of that assigned.

B. Turns

1. Description The applicant may be asked to demonstrate heading changes using

various means to determine rate and amount of turn. He should perform these turns in level, climbing, and descending flight. This may also include changes in airspeed and, if possible, helicopter configuration. Turns for this demonstration may be selected from the following:

a. Standard rate turns.

b. Timed turns.

c. Turns to predetermined headings.

d. Magnetic compass turns.

e. Steep turns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his ability to complete turns within $\pm 10^{\circ}$ of desired headings. He shall maintain altitude within ± 100 ft., and airspeed within ± 10 kts. of that assigned.

C. Climbs and Descents

1. Description The applicant may be asked to demonstrate changes of altitude including:

a. Constant airspeed climbs and descents.

b. Rate climbs and descents.

c. Climbs and descents to predetermined altitudes and headings.

The examiner may request the demonstration be performed in various helicopter configurations, if possible.

2. *Acceptable Performance Guidelines*

The applicant's performance shall be evaluated on his ability to maintain airspeed within ±10 kts. and vertical rate with ±200 ft. per minute of that desired. Level-offs and rollouts shall be completed within ±100 ft. and ±10° of the altitude and heading assigned.

II. IFR NAVIGATION

Objective

To determine that the applicant can safely and efficiently navigate in instrument conditions in the National Airspace System in compliance with Instrument Flight Rules and ATC clearances and instructions.

Procedures/Maneuvers

A. Time, Speed, and Distance

1. Description The applicant may be asked to demonstrate preflight and inflight computations to determine ETE, ETA, wind correction angle, and groundspeed.

2. Acceptable Performance Guidelines

The applicant's performance shall be evaluated on the basis of his ability to make accurate and timely computations.

B. VOR Navigation

1. Description The applicant may be asked to demonstrate:

a. Intercepting a VOR radial at a predetermined angle.

b. Tracking on a selected VOR radial.

c. Determining position using intersecting VOR radials.

2. *Acceptable Performance Guidelines*

The applicant's performance shall be evaluated on the basis of his accuracy in determining his position by means of cross bearings, his interception procedures, and his ability to maintain orientation and the assigned flight path.

C. ADF Navigation

1. Description The applicant may be asked to use ADF for homing, intercepting and tracking predetermined radio bearings to and from non-directional beacons, and for determining position by use of cross bearings.

2. *Acceptable Performance Guidelines*

The applicant's performance shall be evaluated on the basis of his accuracy in determining his position by means of cross bearings, his interception procedures, and his ability to maintain orientation and the assigned track.

D. Navigation by ATC Instructions

1. Description The applicant may be asked to show that he can comply with ATC instructions and procedures. This includes navigation by adherence to radar vectors and specific instructions for headings and altitude changes.

2. *Acceptable Performance Guidelines*

Evaluation of the applicant's performance shall be based on his promptness and ac-

curacy in responding to and complying with ATC navigation instructions.

III. INSTRUMENT APPROACHES

Objective

To determine that the applicant can execute safe and accurate instrument approaches to published minimums under instrument conditions.

Procedures/Maneuvers

A. VOR Approach

1. Description The applicant may be requested to demonstrate a published VOR approach procedure. A circling approach will not be required.

2. Acceptable Performance Guidelines The applicant shall descend at the proper rate to the MDA so as to arrive at a position from which a normal landing approach can be made. Deviations of more than ±10 kts. from the desired approach speed shall be disqualifying. Errors in altitude of more than 100 ft. below prescribed altitudes during the initial approach or descending below the MDA prior to the examiner reporting the runway environment in sight shall be disqualifying.

B. ILS Approach

1. Description The applicant may be requested to demonstrate a published ILS approach procedure. A circling approach will not be required.

2. *Acceptable Performance Guidelines*

As directed by the examiner, the applicant shall descend on a straight-in approach to the DH, arriving at a position from which a normal landing approach can be made. Deviations of more than ±10 kts from the desired approach speed shall be disqualifying. Errors in altitude of more than 100 ft. below prescribed altitudes during the initial approach, full scale deflection of the CDI or the glide slope indicator after glide slope interception, or descending below the DH prior to the examiner reporting the runway environment in sight shall be disqualifying.

C. Localizer Approach

1. Description The applicant may be requested to demonstrate a published localizer approach or an ILS (back course) approach procedure. A circling approach will not be required.

2. *Acceptable Performance Guidelines*

The applicant shall descend at the proper rate to the MDA so as to arrive at a position from which a normal landing approach can be made. Deviations of more than ±10 kts from the desired approach speed shall be disqualifying. Errors in altitude of more than 100 ft. below prescribed altitudes during the initial approach, full scale deflection of the CDI, or descending below the MDA prior to the examiner reporting the runway environment in sight shall be disqualifying.

D. ADF Approach

1. Description The applicant may be requested to demonstrate an ADF approach using a published NDB (non-directional beacon) approach procedure. A circling approach will not be required.

2. Acceptable Performance Guidelines The applicant shall descend at the proper rate to the MDA so as to arrive at a position from which a normal landing approach can be made. Deviations of more than ±10 kts. from the desired approach speed shall be disqualifying. Errors in altitude of more than 100 ft. below prescribed altitudes during the initial approach, or descending below the MDA prior to the examiner reporting the runway environment in sight shall be disqualifying.

IV. CROSS COUNTRY FLYING [2]

Objective

To determine that the applicant can competently conduct en route and terminal operations within the National Airspace System in instrument conditions, using radio aids and complying with ATC instructions.

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[2] The examiner may ask the applicant to plan an IFR cross-country flight and set out on course. The flight may be continued only long enough for the examiner to determine the applicant's competence in IFR cross-country flying.

Procedures/Maneuvers

A. Selection of Route

1. Description The applicant may be asked to select a route for an IFR flight of at least 100 nautical miles, based on information contained in the *Airman's Information Manual*, *Low route Charts*, *Instrument Approach Procedure Charts*, and other appropriate sources of information. This includes facilities for all departures and arrivals.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to obtain and apply pertinent information for the selection of a suitable route. Failure to determine current status and usability of facilities shall be disqualifying.

B. Procurement and Analysis of Weather Information

1. Description The applicant may be asked to procure and analyze weather reports and forecasts pertinent to his proposed flight. This information should provide (1) forecast weather conditions at destination, (2) the basis for selecting an alternate airport, and (3) the basis for selecting a route to avoid severe weather.

2. Acceptable Performance Guidelines The applicant shall correctly analyze the weather reports and forecasts and understand their significance to the proposed flight.

Failure to recognize conditions which would be hazardous to his flight shall be disqualifying.

C. Development of Flight Log

1. Description The applicant may be asked to develop a flight log for the proposed flight. This log should include at least the en route courses, estimated ground speeds, distances between checkpoints, estimated times between checkpoints (ETEs), and amount of fuel required. On the basis of his log, the applicant is expected to prepare an IFR flight plan for the examiner's review.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the completeness and accuracy of his flight log and flight plan.

D. Aircraft Performance and Limitations

1. Description The applicant may be asked to apply the information contained in the helicopter flight manual or manufacturer's published recommendations to determine the aircraft performance capabilities and weight and balance limitations, as appropriate to flight in instrument weather conditions.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his proper application of aircraft performance and loading data in the conduct of the proposed flight.

E. Aircraft Systems and Equipment

1. Description The applicant may be asked to explain the use of the instruments, avionic equipment, and any special system installed in the helicopter used, including indications of malfunctions and limitations of these units.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his knowledge of the instruments and equipment which are installed in the helicopter used for the flight test.

F. Preflight Check of Instruments and Equipment

1. Description Prior to takeoff, the applicant may be asked to perform a systematic operational check of engine instruments, flight instruments, and avionic equipment. All equipment should be appropriately set for his departure clearance. The use of a checklist is recommended.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the thoroughness and accuracy of his checks and procedures. Failure to properly check and set instruments and equipment shall be disqualifying.

G. Maintaining Airways or ATC Routes

(see Pilot Operation II on page 9.)

H. Use of Radio Communications

1. Description The applicant may be asked to demonstrate the use of two-way radio voice communication procedures for reports, ATC clearances, and other instructions. Radio communications may be simulated at the discretion of the examiner.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his use of proper frequencies, correct phraseology, and the conciseness, clarity, and timeliness of his transmissions. Acceptance of clearances based on facilities or frequencies not appropriate to the equipment being used or to the aircraft performance capabilities shall be disqualifying.

I. Holding Procedures

1. Description The applicant may be directed, by ATC or the examiner, to hold in either a standard or a nonstandard pattern at a specified fix. He should make a proper entry as described in the *Airman's Information Manual*, remain within protected airspace, apply adequate wind correction, and accurately time the pattern so as to leave the fix at the time specified.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his compliance with instructions, and his entry procedure, orientation, accuracy

and timing. Deviations of more than ±100 ft. from the prescribed altitude or more than ±10 kts. from holding airspeed shall be disqualifying.

J. Instrument Approach Procedures
(see Pilot Operation III on page 11.)

V. EMERGENCIES

Objective

To determine that the applicant can promptly recognize and take appropriate action for abnormal or emergency conditions and equipment malfunctions while in instrument conditions.

Procedures/Maneuvers

A. Recovery from Unusual Attitudes

1. Description The examiner may place the helicopter in unusual flight attitudes which could result from vertigo, wake turbulence, lapse of attention, or abnormal trim conditions. The applicant should recover and return to the original altitude and heading. For this demonstration, the examiner may limit the use of flight instruments by simulating malfunctions of the attitude indicator and heading indicator. However, particular care should be exercised to avoid overcontrolling or critical flight attitudes when performing these maneuvers.

2. Acceptable Performance Guidelines Evaluation shall be based on the promptness,

smoothness, and accuracy demonstrated. All maneuvering shall be conducted within the operating limitations of the helicopter used. Any loss of control or abrupt control usage, which makes it necessary for the examiner to take over to avoid exceeding any operating limitation of the helicopter shall be disqualifying.

B. Equipment or Instrument Malfunctions

1. Description The applicant may be asked to demonstrate the emergency operation of the retractable gear (if appropriate), and of the electrical, fuel, deicing, and hydraulic systems if operationally practical. Emergency operations such as emergency gear extension (if applicable), or discharge of a pressure fire extinguisher system will be *simulated only*. Occasionally, during the performance of flight maneuvers described elsewhere in this guide, the examiner may simulate a partial or complete loss of flight instruments, navigation instruments, or equipment.

2. Acceptable Performance Guidelines The applicant shall respond to emergency situations in accordance with procedures outlined in the manufacturer's published recommendations. The applicant's performance shall be evaluated on the basis of his competency in maintaining aircraft control,

his knowledge of the emergency procedures, the judgment he displays, and the accuracy of his operations.

C. Loss of Radio Communications

1. Description The examiner may simulate loss of radio communications. The applicant should know the actions required pertaining to altitudes, routes, holding procedures, and approaches.

2. Acceptable Performance Guidelines Evaluation shall be based on the applicant's knowledge of, and compliance with, the pertinent procedures required by Part 91 of the Federal Aviation Regulations and the emergency procedures outlined in the *Airman's Information Manual*. An explanation or simulation of the proper procedures for loss of radio communications is acceptable.

D. Engine-Out Procedures

1. Description The applicant may be asked to demonstrate his ability to positively and accurately maneuver the helicopter during engine-out situations.

In the case of a single-engine helicopter, the examiner may simulate a power failure by closing the throttle (or rotating the throttle to flight-idle, if appropriate). The applicant should enter autorotation immediately.

In the case of a multiengine helicopter, the examiner may simulate a power failure by closing the throttle (or rotating the throttle

to flight-idle, if appropriate) on one engine. The applicant should promptly accomplish the prescribed single-engine procedures.

2. *Acceptable Performance Guidelines*

In the case of a single-engine helicopter, evaluation shall be based on the applicant's ability to safely enter an autorotation. Slow reaction to the simulated emergency, such as failure to lower the collective pitch immediately, failure to maintain rotor r.p.m. within the allowable limits, failure to maintain directional control within $\pm 20°$ of the original heading during the autorotative entry, or failure to maintain an airspeed within ± 10 kts. of that recommended by the manufacturer shall be disqualifying.

In the case of a multiengine helicopter, evaluation shall be based on the applicant's ability to promptly identify the inoperative engine, and to follow the procedures outlined in the manufacturer's published recommendations. In cruising flight, the applicant shall maintain heading and altitude within $\pm 20°$ and ± 100 ft. respectively. If the helicopter is incapable of maintaining altitude with an engine inoperative under existing circumstances, the applicant shall maintain an airspeed within ± 10 kts. of that recommended by the manufacturer.

During approaches, the applicant shall promptly correct any deviation from the desired flight path.

Any loss of control that makes it necessary for the examiner to take over, or any attempt at prolonged flight contrary to the single-engine operating limitations of the helicopter shall be disqualifying.

E. Missed Approach Procedures

1. Description At any time during an instrument approach, the applicant may be asked to execute the missed approach procedure depicted on the approach chart being used. If the examiner does not specifically ask for the missed approach, but fails to report the runway in sight at the DH or MDA, the applicant should immediately initiate the missed approach procedure as described on the chart or as directed by ATC.

2. Acceptable Performance Guidelines The evaluation shall be based on the applicant's timely and correct execution of the missed approach procedure.

F. ASR Approach or Radar Vectors

1. Description The applicant may be requested to demonstrate his ability to perform an ASR approach, or to follow radar vectors, with or without the benefit of a directional gyro. These procedures may be conducted by means of ATC instructions or by simulated ATC instructions given by the examiner.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his knowledge of, and

ability to follow ASR procedures or radar vectors, with or without a directional gyro. Failure to maintain airspeed and altitude within ±10 kts. and ±100 ft. respectively, or failure to maintain r.p.m. within allowable limits shall be disqualifying. Abnormally slow or incorrect response to instructions received shall also be disqualifying.

U. S. GOVERNMENT PRINTING OFFICE : 1973 O - 527-041